



The sage ensures his dues are met, though not expecting others to do the same; in this way he is virtuous.

Lao Tzu (c. 6th century B.C.E.)

WATER POLLUTION

Reviving China's Ruined Rivers

Throughout history, many of China's people have lived and died by the conditions along her seven major rivers. Today, more than 450 million people depend on the two longest rivers—the Huang (Yellow) and the Yangtze—for water, agriculture, fishing, and other uses. But over the past 20 years, water quality in these rivers has deteriorated to a grave state. According to the 2001 World Bank report *China: Air, Land, and Water—Environmental Priorities for a New Millennium*, significant stretches of the two riverways are classified as unsuitable for human contact by the Chinese State Environmental Protection Administration. And according to the central government's 1996 report on the state of the environment, 40% of the monitored sections of all rivers flowing past

cities did not meet China's minimum water quality standards.

The decline in water conditions across China is directly related to China's population growth, strong economic growth, and uncontrolled urbanization and semiurbanization. The worst decline in water quality occurred over the period 1985–1995 with the boom of unregulated township and village enterprises (TVEs) across China's countryside, says Jostein Nygard, coeditor of *China: Air, Land, and Water*. These small communally owned and operated industries provide minimal wastewater treatment compared with larger city industries. Conditions became so serious that in 1995 the government shut down 70,000 medium and small TVEs along China's rivers. The closures had a significant effect in reducing pollutants from TVEs, says Nygard, but pollution levels went up again in 1997 as inputs from other sources, such as homes and agriculture, increased.

The Yellow River, long regarded as the cradle of Chinese civilization, is the most important river for the people of northern and northwestern China. But it has been so heavily overused for irrigation, dams, and other uses that the once powerful river is occasionally

reduced to a trickle, some years not even reaching the ocean. This water shortage prevents the river from flushing its heavy load of pollutants into the Yellow Sea. At the same time, the quantity of wastewater dumped into the river from nonindustry sources has increased, resulting in ever-deteriorating conditions. In some parts of the past decade, water quality in a little over half of the monitored sections of the Yellow River was classified as unsuitable for human contact, irrigation, and agriculture, according to the World Bank report. And pollution concentrations



Serving a nation. More than 450 million Chinese depend on the Yellow and Yangtze Rivers for their livelihood and basic needs. The rapid industrialization and urbanization of China, however, has devastated the waters with industrial, domestic, and agricultural waste.

Mountain High Maps, Christopher G. Reuther/EHP

along major stretches surpass the lethal concentration for fish. Many fish have become extinct in these regions, depriving the people of an important source of food. Mu Lan, the Chinese-language editor for the online non-profit news service Three Gorges Probe, notes that the Yellow River carp, once an important staple for the people, “has become so rare that only high-ranking officials and rich businessmen can pay money to taste it.”

The Yangtze River is known for its visible debris and “floating ducks” (a nickname for the foam from paper mills). But compared with the Yellow River, the Yangtze seems relatively clean. According to *China: Air, Land, and Water*, as of 1998 pollution levels along much of the Yangtze River were classified as moderate or better; still, 15% of the samples from the river were classified as unsuitable for human contact. A January 2002 statement by the Yangtze River Water Resources Committee of the Chinese government, issued through the Xinhua News Agency, reported that 23.4 billion tons of sewage and industrial waste was dumped into the Yangtze and its branches in 2000, 11% more than in the preceding year.

The long list of organic and inorganic pollutants found in these two rivers—including human excreta, industrial chemicals, heavy metals, cyanide, and solvents—suggests that the largest waste loads are coming from domestic sources as well as from the paper, steel, silk, and chemical factories that line the Yangtze, although agriculture and other non-point sources of pollution are also significant contributors, say experts. Bacterial pollutants are not monitored routinely yet are probably widespread, based on reports of contamination with human and animal waste, states *China: Air, Land, and Water*.

China’s recent forays into dam construction constitute another factor in the buildup of pollutants, according to *Dams and Development: A New Framework for Decision-Making*, which summarizes the findings of a two-year review of dams around the globe by the World Commission on Dams. A number of health experts and environmentalists warn that the Three Gorges Dam, in particular, will compound existing pollution and introduce new health risks along the Yangtze basin.

Situated above the city of Yichang in central China, the Three Gorges Dam will

be the world’s largest when completed in 2009. *Dams and Development* points to risks of epidemics associated with overcrowding in the settlements of inhabitants displaced by the reservoir. In addition, overaccumulation of mercury in fish, cyanobacterial toxin contamination, poor drinking water quality, and numerous vectorborne diseases are associated with reservoir development in tropical areas. A 16 May 1998 commentary in *Lancet* by University of Queensland lecturers Adrian Sleigh and Sukhan Jackson notes that epidemics of schistosomiasis, malaria, and other parasitic infections have occurred around many reservoirs created by dams elsewhere, and that schistosomiasis has persisted along the Yangtze despite a 40-year control project in the reservoir area. Sleigh and Jackson also warn that health services, water supplies, and sanitation are inadequate to treat epidemics that may arise as a result of the Three Gorges Dam.

One of the most vocal of the megadam’s critics is Dai Qing, a former ballistic missile engineer and intelligence agent who currently works as a freelance writer. She warns that, among other things, the dam will prevent the river from flushing debris from the

basin. Instead, debris will collect behind the dam. “The worst problem,” she says, “is that people will depend on the polluted water for drinking water.”

The challenge of reducing pollution along China’s rivers is immense and complex. China continues to invest large sums of money in the construction of water treatment plants across the country. The World Bank is currently involved in the construction of three plants along the Yangtze, and the Chinese government has placed a high priority on cleaning up water quality throughout the nation.

But the decentralization of the Chinese government presents special challenges to the cleanup effort. As Mats Andersson, the World Bank’s director of urban development in China, points out, “The Water Ministry can set regulations and recommend wastewater treatment plants, but . . . it is up to the provincial governments to enforce many regulations and to make the final decisions regarding waste treatment. If local governments are not able or willing to put money into improving water quality, the rivers don’t get cleaned up.” —**Corliss Karasov**



A local issue. The central government places a high priority on water quality, but real change depends on the commitment of provincial leaders.

Cutting Pesticide Sales in Canada

In March 2002 Canada’s largest food retailer, Loblaw Companies, announced that beginning in 2003 it would no longer sell chemical pesticides in its 440 garden centers. Loblaw spokesman Geoff Wilson said the decision was based on a change of consumer opinion and public policy, and the realization that many suppliers are already developing organic alternatives to their regular products. In June 2001, Canada’s Supreme Court upheld an earlier decision that municipalities have the right to ban the use of chemical pesticides on public and private property. For the duration of 2002, Loblaw stores will phase in organic pesticides and gardening alternatives, and hand out educational materials to help customers learn more about these new products.



EU to Curb Chemicals

The European Commission has proposed plans to restrict the public sale and use of 43 chemicals that are classified as carcinogens, mutagens, and/or reproductive toxicants. These chemicals, which include butadiene, beryllium oxide, furans, sodium chromate, and dibutyl phthalate, are widely used industrially in such items as paints, varnishes, printing inks, and adhesives. They will still be available to industrial users who can ensure they will be used safely. The EU Council of Ministers and the European Parliament are expected to pass the legislation with little debate.

Chinese MBAs Learn Environmental ABCs

Professors from over half of China’s top business schools gathered with international business experts in April 2002 for the International Conference on Business and Environment Education, held in Beijing and organized by the World Resources Institute (WRI) and China’s State Environmental Protection Administration. A “model business” core curriculum developed by a consortium of Chinese universities and U.S. business schools and corporations was presented at the meeting, along with teaching materials and case studies translated into Chinese. WRI director of business education Rick Bunch said, “Preparing [China’s MBA students] today to manage their firms sustainably tomorrow should reap great benefits not only for China’s environment but also for the world’s.”



BUILT ENVIRONMENT

Beijing Goes for the Olympic Green

When Beijing was awarded the 2008 Summer Olympics, critics wondered if China's capital city would be environmentally ready for the big event. But reports indicate that the municipal government and the organizing committee for the 2008 games are moving aggressively to address the environmental problems that plague Beijing.

"Beijing is like a lot of big cities that are developing rapidly," says James Longhurst, director of the Centre for Research in Environmental Systems, Pollution, and Remediation at the University of the West of England, who recently spoke at the International Environmental Protection Congress in Beijing on air quality management. "It faces serious environmental risk so long as environmental and enforcement practices don't keep pace with the rate of change."

Coal burning and automobile and industrial emissions, for instance, are so unregulated

that the air pollution sometimes makes it difficult for residents to see more than a few hundred yards. For years industries and homes dumped untreated waste directly into the city's rivers, and today the city has limited clean water resources and the capacity to treat less than one-quarter of its sewage, according to Beijing's vice mayor Yue Fuhong.

But the games bring new hope to beleaguered Beijing. By 2007 the city will have spent US\$12.2 billion on improving its environment. "China is confident it can showcase an environmentally healthy Beijing to the world by the time the Olympic Games begin," says Rick Hirsekorn, vice president for the Denver, Colorado, environmental consulting company CH2M HILL, which advised the Beijing organizing committee.

The Beijing Action Plan for the 2008 Olympic Games, made public last April, reveals many improvements China expects to make by 2007. For example, 14 new water treatment plants will be built in Beijing. Pipelines will be extended to import natural gas from other

provinces, and about 90% of buses and 70% of taxis will be retrofitted or purchased new to use natural gas. Some 83% of Beijing's energy will come from natural gas, and coal will be used only in a few large power plant boilers.

Thousands of hectares of green belts will line the major rivers, roads, and city borders.

"China is an authoritarian government that operates via central planning," says Pamela Gordon, author of *Lean and Green: Profit for Your Workplace and the Environment* and president of Technology Forecasters, an Alameda, California-based company that consults to the global electronics industry. "That means the country's leadership can make tough big-ticket decisions and implement them quickly."

Experts hope the environmental consciousness sparked by the Olympics will rub off on the rest of China. "Hosting the games will be very beneficial for China environmentally," Hirsekorn says. "It should serve as a catalyst for environmental improvement and help to promote sustainable development." —Ron Chepesiuk



AGRICULTURE

Chinese Crops: A Soiled Image?

As China aims to boost its agricultural production, its farmers' own zeal may prove to be the biggest obstacle to increasing exports. In the industrialized south, particularly, where agrochemicals are more readily available, farmers use such great amounts that consumers are growing leery of health risks.

Between 1949 and 1995, China's application of inorganic fertilizers soared, finally slowing in recent years to rates comparable with its more industrialized neighbors. But researchers at The Hong Kong Polytechnic University say farmers in Guangdong province still apply an estimated 800 kg/ha, or five times the world average. In that region's Pearl River Delta, some experts suspect farm pesticide residue of a role in nearly extinguishing the local pink dolphins.

In the August 2002 issue of *Environmental Pollution*, researchers from



Sales cropped? Heavy agrochemical use in China may be bad for business.

Hong Kong Polytechnic and the Guangzhou Institute of Geochemistry report mean cadmium concentrations of 0.58 mg/kg in the soil of farms growing cash crops. Associated with pesticides and fertilizers, cadmium is a known human carcinogen, and chronic long-term ingestional exposure is associated with kidney damage and osteoporosis. Although scientists don't know how much food exposure those concentrations translate into, the paper notes that continuous heavy application of agrochemicals and other soil amendments could exacerbate the accumulation of heavy metals in agricultural soils over time, as well as increase the amount that runs off the soil. Another report, in the 25 October 2001 issue of the *Far Eastern Economic Review*, states that China is the only country seeking a waiver to use DDT "as a general intermediate" and not just in the low concentrations used for malaria prevention. Chinese newspapers have reported high concentrations of DDT in some food items.

Economics shapes farmers' use of chemicals, says Alex Lu, a senior research scientist at the University of Washington's Department of Environmental Health: "While some new agricultural chemicals are safer and more environmentally friendly, old nasty stuff like DDT is effective at a much lower price."

Robert Crooks, lead author of the 2001 World Bank report *China: Air, Land, and Water—Environmental Priorities for a New Millennium*, says Chinese farmers—like farmers around the world—want clear evidence that chemicals can knock weeds down dead. Until they get concrete information about health risks, those risks get low priority.

Various sources agree that the Chinese government's control over farmer pesticide practices is loosening. Where policy fails, however, market incentives and education may help. On 16 February 2002, the *South China Morning Post* noted that foreign fruits were becoming more popular among Chinese consumers, and that imports of Chinese fruits in other countries trailed expectations by nearly 10-fold. The paper cited consumer concerns over heavy pesticide use as the problem.

"The more cases of exports being rejected due to contamination, the more likely the government will be to tighten up regulations and enforcement," says Crooks. "They are aware of the problem and have begun to take steps in the right direction." —David A. Taylor



Environmental Change and Security Project

The Washington, D.C.–based Woodrow Wilson International Center for Scholars, established by Congress in 1968 as a memorial to the nation's 28th president, fosters scholarship and intellectual exchange among scholars and policy practitioners. In 1994, the center launched the Environmental Change and Security Project (ECSP), which hosts meetings and publishes books and journals, all with the goal of providing a neutral forum for stakeholders to explore issues related to the environment, population, and security. The ECSP has established a website, located at <http://ecsp.si.edu/>, to further this goal.

In 1997, the ECSP formed the China Environment Forum. This group coordinates meetings and publications focusing on the environment with respect to U.S.–China relations. Forum meetings bring together participants from a broad spectrum of affiliations; the focus is on how to tackle the most important environmental and sustainable development issues confronted by China and ways to foster international governmental and nongovernmental organization cooperation on these issues.

The China Environment Forum link takes visitors to the annually published *China Environment Series*. Each issue of the series contains several feature articles and a "Commentary/Notes From the Field" section that provides an outlet for work by new China studies scholars and researchers. Topics covered have included water pollution, public transportation, energy use, and changes faced by Chinese environmental groups and news media. Each issue also provides summaries of China Environment Forum meetings, an in-depth inventory of governmental and nongovernmental environmental work being conducted in China, and a bibliographic guide to pertinent literature.

The China Environment Forum page also has a link to an electronic version of *Climate Action in the United States and China*, a recent report from the Woodrow Wilson Center and Pacific Northwest National Laboratory. This document analyzes how the titular countries have reduced carbon emissions by millions of tons each year and how, despite these measures, such emissions are still rising. The report is available in both Chinese and English.

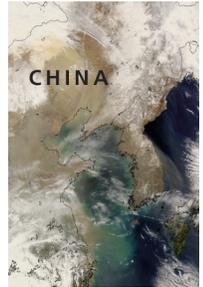
But the ECSP doesn't focus just on China. Back on the main ECSP page, clicking on the Meetings link takes visitors to a list of the most recent meetings the project has sponsored. These include discussions on finding the connection between population growth and global water problems. Also included are speeches by experts and policy makers on such topics as how enlarging the European Union could impact environmental quality and policies in Central and Eastern Europe, and setting an agenda for the World Summit in Sustainable Development. Selecting any event title directs visitors to background information on the meeting topic and an overview of the meeting's proceedings. The Current Events page also features a compilation of links related to individual meetings, such as personal webpages of the speakers and those of associated organizations.

From the homepage, visitors can also register to join the ECSP-FORUM list server, an archived and searchable e-mail group that allows scholars and policy makers to share their latest research results, discuss current policy trends, and debate how to best address the complex issues surrounding the conjunction of the environment, population, and security. —Erin E. Dooley



China Deals with Dust

China has announced it will spend more than US\$1 billion during the next decade to stop the forest shrinkage and rapid desertification that have been blamed for severe floods and sand storms. Seedlings and grasses will be planted over almost half a million square kilometers, which could reduce wind speeds by up to 50% and cut sand and dust from barren land by up to 99%. As part of this program, 180,000 people living near Beijing will be relocated to make room for plantings. Strict logging bans will be implemented in 13 provinces in the middle and upper regions of the Yellow and Yangtze River watersheds. Local governments not complying with the bans and other new mandatory forestry rules will lose funding from the national government.



China to Slash SO₂

China has implemented a new coal policy it hopes will reduce SO₂ emissions by 10% over 2000 levels by 2005. Coal consumption currently contributes more than 90% of China's SO₂ emissions; as of 1999, coal accounted for just over 67% of the country's total primary energy consumption. SO₂ has been linked to human health effects such as respiratory illness, alterations in lung defenses, and aggravation of existing heart disease. The new policy requires power companies and large industrial facilities to install desulfurization equipment. Smaller facilities must use low-sulfur coal or cleaner fuel alternatives. Household coal consumers are urged to switch to cleaner energy sources such as gas and electricity or to use sulfur-fixing coal briquettes instead of raw coal.

Japan Tackles Computer Recycling

As early as fall of 2003, Japan could enact a new system for recycling household computer equipment. Japan's current computer recycling program processes only commercially used items and requires companies to pay disposal costs. To finance the new system, computers sold after its implementation will have recycling fees of ¥2,000–5,000 (US\$17–43) added to their price, while consumers will have to pay to dispose of items purchased before the system's introduction. According to a draft report on the program, in 2001 alone Japanese consumers discarded some 9,000 tons of household computers containing significant amounts of lead, mercury, and brominated fire retardants. This figure is expected to more than double by 2006.

